

SEQUENCE LISTING

<110> Thompson, John E.
Wang, Tzann-Wei
Hudak, Katalin
Hong, Yuwen

<120> DNA ENCODING A PLANT LIPASE, TRANSGENIC PLANTS AND A
METHOD FOR CONTROLLING SENESCENCE IN PLANTS

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<150> 09/250,280

<151> 1999-02-16

<150> 09/105,812

<151> 1998-06-26

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<170> PatentIn Ver. 2.1

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 Gly Ser Ser Arg Tyr Glu Lys Ala Asp Leu Leu His Lys Thr Ala Phe
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 Ala Lys Val Ser Val Pro Glu Ala Phe Leu Leu Lys Ser Arg Ser Arg
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 Glu Lys Trp Asp Arg Glu Ser Asn Trp Ile Gly Tyr Val Val Val Ser
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 Met Thr Lys Tyr Lys Asp Glu Thr Leu Ser Ile Thr Phe Ala Gly His
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Lys Asn Asp Glu Asp Glu Asp Glu Asp Glu Asp Glu Ile Lys Val Met
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Asp Gly Trp Leu Lys Ile Tyr Val Ser Ser Asn Pro Lys Ser Ser Phe
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acg aga cta agt gca aga gaa caa ctt caa gca aag att gaa aag tta 239
Thr Arg Leu Ser Ala Arg Glu Gln Leu Gln Ala Lys Ile Glu Lys Leu
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Arg Asn Glu Tyr Lys Asp Glu Asn Leu Ser Ile Thr Phe Thr Gly His
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Ser Leu Gly Ala Ser Leu Ala Val Leu Ala Ser Phe Asp Val Val Glu
95 100 105 110

aat ggt gtg cca gtt gat att cca gta tct gca att gta ttt ggt agt 383
Asn Gly Val Pro Val Asp Ile Pro Val Ser Ala Ile Val Phe Gly Ser
115 120 125

cca caa gtt ggg aat aag gca ttc aat gaa aga atc aag aaa ttc tca 431
Pro Gln Val Gly Asn Lys Ala Phe Asn Glu Arg Ile Lys Lys Phe Ser
130 135 140

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Asn Leu Asn Ile Leu His Val Lys Asn Lys Ile Asp Leu Ile Thr Leu
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 Gln Val Thr Tyr Asp Thr Phe Ile Asn Asp Gln Asn Ser Ser Tyr Cys
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 Ala Lys Val Ser Val Pro Glu Ala Phe Leu Leu Lys Ser Arg Ser Arg
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 Glu Lys Trp Asp Arg Glu Ser Asn Trp Ile Gly Tyr Val Val Val Ser
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 Trp Arg Gly Thr Cys Arg Asp Tyr Glu Trp Val Asp Val Leu Gly Ala
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 Gln Leu Glu Ser Ala His Pro Leu Leu Arg Thr Gln Gln Thr Thr His
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 Val Glu Lys Val Glu Asn Glu Glu Lys Lys Ser Ile His Lys Ser Ser
 180 185 190
 Trp Tyr Asp Cys Phe Asn Ile Asn Leu Leu Gly Ser Ala Ser Lys Asp
 195 200 205
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 210 215 220
 Gln Gly Trp Met Thr Ile Tyr Thr Ser Glu Asp Pro Lys Ser Pro Phe
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 260 265 270
 Ser Leu Gly Ala Thr Leu Ser Val Val Ser Ala Phe Asp Ile Val Glu
 275 280 285
 Asn Leu Thr Thr Glu Ile Pro Val Thr Ala Val Val Phe Gly Cys Pro
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 305 310 315 320
 Leu Asn Val Leu His Val Arg Asn Val Ile Asp Leu Ile Pro Leu Tyr
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 Pro Val Lys Leu Met Gly Tyr Val Asn Ile Gly Ile Glu Leu Glu Ile
 340 345 350
 Asp Ser Arg Lys Ser Thr Phe Leu Lys Asp Ser Lys Asn Pro Ser Asp
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 Trp His Asn Leu Gln Ala Ile Leu His Val Val Ser Gly Trp His Gly
 370 375 380
 Val Lys Gly Glu Phe Lys Val Val Asn Lys Arg Ser Val Ala Leu Val
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 His Tyr Gly Glu Met Ala Gln Ala Gly Tyr Asp Thr Phe Asn Ile Asn
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Thr Glu Ser Gln Phe Ala Gly Ala Ser Ile Tyr Ser Arg Lys Asp Phe
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 Ile Tyr Met Ser Gln Asp Glu Arg Ser Pro Phe Thr Lys Thr Asn Ala
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 Arg Asp Gln Val Leu Arg Glu Val Gly Arg Leu Leu Glu Lys Tyr Lys
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 Asp Glu Glu Val Ser Ile Thr Ile Cys Gly His Ser Leu Gly Ala Ala
 225 230 235 240
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 Pro Lys Ser Arg Pro Asp Lys Ser Cys Pro Val Thr Ala Phe Val Phe
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 Ala Ser Pro Arg Val Gly Asp Ser Asp Phe Arg Lys Leu Phe Ser Gly
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 Phe Gly Trp Lys Glu Cys Asp Asn Thr Ala Ile Leu Tyr Gly Asp Val
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 Gly Val Gly Leu Val Ile Asp Ser Lys Lys Ser His Tyr Leu Lys Pro
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195 200 205

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Asp Ser Asp Leu Ser Ile Thr Val Thr Gly His Ser Leu Gly Gly Ala
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Ser Pro Gly Leu Phe Leu Asn Glu Ser Arg Pro His Ala Leu Met Lys
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325 330 335

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340 345 350

Ser Thr Ala His Asn Leu Glu Ala Met Leu His Leu Leu Asp Gly Tyr
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His Gly Lys Gly Glu Arg Phe Val Leu Ser Ser Gly Arg Asp His Ala
 370 375 380

Leu Val Asn Lys Ala Ser Asp Phe Leu Lys Glu His Leu Gln Ile Pro
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Pro Phe Trp Arg Gln Asp Ala Asn Lys Gly Met Val Arg Asn Ser Glu
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 Leu Gln Ser Gln Ser Arg Asp Ser Trp Asp Arg Glu Ser Asn Trp Phe
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 85 90 95

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Tyr Lys Asp Glu Lys Pro Ser Ile Val Leu Thr Gly His Ser Leu Gly	
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Lys Lys Ser Pro Phe Leu Ser Asp Ser Arg Asn Pro Gly Asp Trp His	
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Asn Leu Gln Ala Met Leu His Val Val Ala Gly Trp Asn Gly Lys Lys	
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Gly Glu Phe Lys Leu Met Val Lys Arg Ser Ile Ala Leu Val Asn Lys	
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Arg Glu Ile Tyr Ile Ala Leu Arg Gly Thr Ser Arg Asn Tyr Glu Trp
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100 105 110

Asp Ser Asp Ser Glu Asp Glu Glu Gly Cys Lys Val Met Leu Gly Trp
115 120 125

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Ser Asp Asp Val Pro Val Thr Ala Ile Val Phe Gly Cys Pro Gln Val
195 200 205

Gly Asn Lys Glu Phe Arg Asp Glu Val Met Ser His Lys Asn Leu Lys
210 215 220

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Gly Leu Leu Gly Tyr Val Asp Ile Gly Ile Asn Phe Val Ile Asp Thr
245 250 255

Lys Lys Ser Pro Phe Leu Ser Asp Ser Arg Asn Pro Gly Asp Trp His
 260 265 270

Asn Leu Gln Ala Met Leu His Val Val Ala Gly Trp Asn Gly Lys Lys
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Gly Glu Phe Lys Leu Met Val Lys Arg Ser Ile Ala Leu Val Asn Lys
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Ser Cys Glu Phe Leu Lys Ala Glu Cys Leu Val Pro Gly Ser Trp Trp
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<212> PRT

<213> Lycopersicon esculentum

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 35 40 45

Trp Leu Lys Ile Tyr Val Ser Ser Asn Pro Lys Ser Ser Phe Thr Arg
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Leu Ser Ala Arg Glu Gln Leu Gln Ala Lys Ile Glu Lys Leu Arg Asn
 65 70 75 80

Glu Tyr Lys Asp Glu Asn Leu Ser Ile Thr Phe Thr Gly His Ser Leu
 85 90 95

Gly Ala Ser Leu Ala Val Leu Ala Ser Phe Asp Val Val Glu Asn Gly
 100 105 110

Val Pro Val Asp Ile Pro Val Ser Ala Ile Val Phe Gly Ser Pro Gln
 115 120 125

Val Gly Asn Lys Ala Phe Asn Glu Arg Ile Lys Lys Phe Ser Asn Leu
 130 135 140

Asn Ile Leu His Val Lys Asn Lys Ile Asp Leu Ile Thr Leu Tyr Pro
 145 150 155 160

Ser Ala Leu Phe Gly Tyr Val Asn Ser Gly Ile Glu Leu Val Ile Asp
 165 170 175

Ser Arg Lys Ser Pro Ser Leu Lys Asp Ser Lys Asp Met Gly Asp Trp
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His Asn Leu
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 Arg Arg Leu Arg Asp Thr Trp Arg Lys Ile Gln Gly Glu Asp Asp Trp
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gcc ggg tta atg gat cca atg gat cca att ctt aga tcg gag cta atc 144
 Ala Gly Leu Met Asp Pro Met Asp Pro Ile Leu Arg Ser Glu Leu Ile
 35 40 45

cgt tac ggc gaa atg gct caa gct tgt tac gac gct ttc gat ttc gat 192
 Arg Tyr Gly Glu Met Ala Gln Ala Cys Tyr Asp Ala Phe Asp Phe Asp
 50 55 60

ccc gct tcc aaa tac tgc ggc acc tcc agg ttc acg cga ctc gag ttc 240
 Pro Ala Ser Lys Tyr Cys Gly Thr Ser Arg Phe Thr Arg Leu Glu Phe
 65 70 75 80

ttc gat tct ctc gga atg atc gat tcc ggt tac gag gtg gcg cgt tac 288
 Phe Asp Ser Leu Gly Met Ile Asp Ser Gly Tyr Glu Val Ala Arg Tyr
 85 90 95

ctc tac gcg acg tcg aac atc aat ctc ccg aac ttc ttc tcg aaa tcg 336
 Leu Tyr Ala Thr Ser Asn Ile Asn Leu Pro Asn Phe Phe Ser Lys Ser
 100 105 110

cgg tgg tct aaa gtc tgg agc aaa aac gct aat tgg atg gga tac gtc 384
 Arg Trp Ser Lys Val Trp Ser Lys Asn Ala Asn Trp Met Gly Tyr Val
 115 120 125

gcc gtt tca gac gac gaa acg tct cgt aac cga ctc ggc cgc cgt gat 432
 Ala Val Ser Asp Asp Glu Thr Ser Arg Asn Arg Leu Gly Arg Arg Asp
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 Ile Ala Ile Ala Trp Arg Gly Thr Val Thr Lys Leu Glu Trp Ile Ala
 145 150 155 160

gat cta aag gat tat tta aaa ccg gta acc gaa aac aag atc cga tgc 528
 Asp Leu Lys Asp Tyr Leu Lys Pro Val Thr Glu Asn Lys Ile Arg Cys
 165 170 175

ccc gac ccg gcc gtt aaa gtc gaa tcc gga ttc tta gat ctc tac act 576
 Pro Asp Pro Ala Val Lys Val Glu Ser Gly Phe Leu Asp Leu Tyr Thr
 180 185 190

gac aaa gac aca acc tgc aaa ttc gcg aga ttc tca gcg cgt gaa cag 624
 Asp Lys Asp Thr Thr Cys Lys Phe Ala Arg Phe Ser Ala Arg Glu Gln
 195 200 205

att tta acg gag gtg aaa cgg tta gtg gaa gaa cac ggc gac gac gat 672
 Ile Leu Thr Glu Val Lys Arg Leu Val Glu Glu His Gly Asp Asp Asp
 210 215 220

gat tcc gat tta agc atc acc gtg acg gga cac agt ctc ggc ggc gcg 720
 Asp Ser Asp Leu Ser Ile Thr Val Thr Gly His Ser Leu Gly Gly Ala
 225 230 235 240

tta gcg ata tta agc gcg tac gat ata gcg gag atg aga ttg aat cgg 768
 Leu Ala Ile Leu Ser Ala Tyr Asp Ile Ala Glu Met Arg Leu Asn Arg
 245 250 255

agt aag aaa ggg aaa gtg att ccg gtg acg gtg ttg aca tac gga gga 816
 Ser Lys Lys Gly Lys Val Ile Pro Val Thr Val Leu Thr Tyr Gly Gly
 260 265 270

ccg aga gtt ggg aac gtt agg ttt agg gag agg atg gag gaa ttg gga 864
 Pro Arg Val Gly Asn Val Arg Phe Arg Glu Arg Met Glu Glu Leu Gly
 275 280 285

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 Val Lys Val Met Arg Val Val Asn Val His Asp Val Val Pro Lys Ser
 290 295 300

ccg gga ttg ttt ttg aac gag agt aga cct cac gcg ctg atg aag ata 960
 Pro Gly Leu Phe Leu Asn Glu Ser Arg Pro His Ala Leu Met Lys Ile
 305 310 315 320

gcg gag ggg ttg ccg tgg tgt tat agc cac gtg ggg gag gag ctg gcg 1008
 Ala Glu Gly Leu Pro Trp Cys Tyr Ser His Val Gly Glu Glu Leu Ala
 325 330 335

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 Leu Asp His Gln Asn Ser Pro Phe Leu Lys Pro Ser Val Asp Val Ser
 340 345 350

act gct cat aat ctt gaa gct atg ctt cat tta ctt gac ggg tat cat 1104
 Thr Ala His Asn Leu Glu Ala Met Leu His Leu Leu Asp Gly Tyr His
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gga aaa gga gag aga ttt gtg ctg tcg agt ggg aga gac cat gcg cta 1152
 Gly Lys Gly Glu Arg Phe Val Leu Ser Ser Gly Arg Asp His Ala Leu
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 Val Asn Lys Ala Ser Asp Phe Leu Lys Glu His Leu Gln Ile Pro Pro
 385 390 395 400

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 Phe Trp Arg Gln Asp Ala Asn Lys Gly Met Val Arg Asn Ser Glu Gly
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cgt tgg att caa gcc gag cgt ctc cgt ttt gag gat cat cat tct cct 1296
 Arg Trp Ile Gln Ala Glu Arg Leu Arg Phe Glu Asp His His Ser Pro
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 35 40 45

Arg Tyr Gly Glu Met Ala Gln Ala Cys Tyr Asp Ala Phe Asp Phe Asp
 50 55 60

Pro Ala Ser Lys Tyr Cys Gly Thr Ser Arg Phe Thr Arg Leu Glu Phe
 65 70 75 80

Phe Asp Ser Leu Gly Met Ile Asp Ser Gly Tyr Glu Val Ala Arg Tyr
 85 90 95

Leu Tyr Ala Thr Ser Asn Ile Asn Leu Pro Asn Phe Phe Ser Lys Ser
 100 105 110

Arg Trp Ser Lys Val Trp Ser Lys Asn Ala Asn Trp Met Gly Tyr Val
 115 120 125

Ala Val Ser Asp Asp Glu Thr Ser Arg Asn Arg Leu Gly Arg Arg Asp
 130 135 140

Ile Ala Ile Ala Trp Arg Gly Thr Val Thr Lys Leu Glu Trp Ile Ala
 145 150 155 160

Asp Leu Lys Asp Tyr Leu Lys Pro Val Thr Glu Asn Lys Ile Arg Cys
 165 170 175

Pro Asp Pro Ala Val Lys Val Glu Ser Gly Phe Leu Asp Leu Tyr Thr
 180 185 190

Asp Lys Asp Thr Thr Cys Lys Phe Ala Arg Phe Ser Ala Arg Glu Gln
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 Ile Leu Thr Glu Val Lys Arg Leu Val Glu Glu His Gly Asp Asp Asp
 210 215 220
 Asp Ser Asp Leu Ser Ile Thr Val Thr Gly His Ser Leu Gly Gly Ala
 225 230 235 240
 Leu Ala Ile Leu Ser Ala Tyr Asp Ile Ala Glu Met Arg Leu Asn Arg
 245 250 255
 Ser Lys Lys Gly Lys Val Ile Pro Val Thr Val Leu Thr Tyr Gly Gly
 260 265 270
 Pro Arg Val Gly Asn Val Arg Phe Arg Glu Arg Met Glu Glu Leu Gly
 275 280 285
 Val Lys Val Met Arg Val Val Asn Val His Asp Val Val Pro Lys Ser
 290 295 300
 Pro Gly Leu Phe Leu Asn Glu Ser Arg Pro His Ala Leu Met Lys Ile
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 Ala Glu Gly Leu Pro Trp Cys Tyr Ser His Val Gly Glu Glu Leu Ala
 325 330 335
 Leu Asp His Gln Asn Ser Pro Phe Leu Lys Pro Ser Val Asp Val Ser
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 Thr Ala His Asn Leu Glu Ala Met Leu His Leu Leu Asp Gly Tyr His
 355 360 365
 Gly Lys Gly Glu Arg Phe Val Leu Ser Ser Gly Arg Asp His Ala Leu
 370 375 380
 Val Asn Lys Ala Ser Asp Phe Leu Lys Glu His Leu Gln Ile Pro Pro
 385 390 395 400
 Phe Trp Arg Gln Asp Ala Asn Lys Gly Met Val Arg Asn Ser Glu Gly
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